WASHINGTON DEPARTMENT OF ECOLOGY

ENVIRONMENTAL ASSESSMENT PROGRAM

FRESHWATER MONITORING UNIT

STREAM DISCHARGE TECHNICAL NOTES

STATION ID: 45F070

STATION NAME: Peshastin Creek at Green Bridge Road

WATER YEAR: 2009

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Introduction

Watershed Description

Peshastin Creek originates in the snowfields of the eastern slopes of the central Cascade Mountain range and flows into the Wenatchee River at river mile 17. The watershed is bounded by both the Stuart Range (Mount Stuart: 9,415 ft) and the Wenatchee Mountains. Land cover above the gage consists of predominantly coniferous forest, but also includes alpine shrubland, montane grassland, bedrock/talus slopes, and riparian woodlands. A large portion of the lower watershed is used for agricultural production (tree fruit). Mean annual precipitation across the watershed above this gage location is 36 inches (U.S. Weather Bureau, 1965).

Gage Location

The telemetered stream gaging station on Peshastin Creek at Green Bridge Road was installed on September 20, 2002. The gage is located at the Green Bridge Road bridge on the right bank, approximately 1.4 miles upstream of the mouth.

Table 1.

Drainage Area (square miles)	134 (USGS, 2013)
Latitude (degrees, minutes, seconds)	47°33’09” N
Longitude (degrees, minutes, seconds)	120°36’13” W

Discharge

Table 2. Discharge Statistics.

Mean Annual Discharge (cfs)	170
Median Annual Discharge (cfs)	96
Maximum Daily Mean Discharge (cfs)	1490
Minimum Daily Mean Discharge (cfs)	6.5
Maximum Instantaneous Discharge (cfs)	2330
Minimum Instantaneous Discharge (cfs)	6.2
Discharge Equaled or Exceeded 10 % of Recorded Time (cfs)	447
Discharge Equaled or Exceeded 90 % of Recorded Time (cfs)	18
Number of Days Discharge is Greater Than Range of Ratings	0
Number of Days Discharge is Less Than Range of Ratings	0

Note: Statistics displayed in Table 2 may not include values in which the predicted discharge exceeds the range of ratings.

Narrative

Seven discharge measurements were taken, ranging from 18.5 to 413 cfs. The maximum reported discharge was reached on November 12, 2008, during a notable fall storm. However, in early January, a significant rain-on-snow event occurred, rapidly raising stage underneath the already frozen creek. This event resulted in station damage, loss of data, and Highway 97 being closed for a couple of weeks due to washouts. The minimum discharge was recorded during baseflow conditions on October 1, 2008. Discharge was influenced by upstream seasonal irrigation operations, most notably during the month of September.

Error Analysis

Table 3. Error Analysis Summary.

Logger Drift Error (% of discharge)	2.2%
Weighted Rating Error (% of discharge)	14.9%
Total Potential Error (% of discharge)	17.1%

Rating Table(s)

Table 4. Rating Table Summary

Rating Table No.	#6		
Period of Ratings	10/01/2008-09/30/2009		
Range of Ratings (cfs)	3.75-5880		
No. of Defining Measurements	43		
Rating Error (%)	14.9%		

Rating Table No.			
Period of Ratings			
Range of Ratings (cfs)			
No. of Defining Measurements			
Rating Error (%)			

Rating Table No.			
Period of Ratings			
Range of Ratings (cfs)			
No. of Defining Measurements			
Rating Error (%)			

Narrative

The water year began with Table #6 carrying over from the previous water year, and was valid for the remainder of this water year.

Stage Record

Table 5. Stage Record Summary

Minimum Recorded Stage (feet)	0.57
Maximum Recorded Stage (feet)	4.52
Range of Recorded Stage (feet)	3.95
Number of Un-Reported Days	45
Number of Days Qualified as Estimates	7
Number of Days Qualified as Unreliable Estimates	0

Narrative

Unreported days were due to an ice-impacted channel, in which the stage-discharge relationship was not valid. In addition, during a significant rain-on-snow event in early January, the station was damaged by the rapid break up of channel ice. The stage record is considered an estimate for seven days during the water year. Two of the days qualified as estimates because a high flow model was used to extrapolate the measured range of discharge. The remaining qualified days (four reliable estimates and one questionable estimate) followed the period of station damage and an instance of upstream channel icing.

Modeled Discharge

Table 6. Model Summary

Model Type (Slope conveyance, other, none)	Slope Conveyance
Range of Modeled Stage (feet)	3.64 to 6.73
Range of Modeled Discharge (cfs)	1440 to 5880
Valid Period for Model	11/12/2006 to NOW
Model Confidence	+/-1.25%

Surveys

Table 7. Survey Type and Date (station, cross section, longitudinal)

Type	Date
Station Levels	09/19/2007

Activities Completed

After the rain-on-snow event in early January, the station was repaired on January 27, 2009. At this point, the laser level became the primary gage index.